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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,161	06/20/2000	Ichiro Okabe	025311/0105	5143

22428 7590 06/30/2004

FOLEY AND LARDNER  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER
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DIAZ, JOSE R

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/597,161	Applicant(s) OKABE ET AL.	
	Examiner José R. Díaz	Art Unit 2815	<i>AW</i>

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,5,6,8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6,8 and 9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3, 5-6, and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheung et al. (EP 0 840 361 A2).

Regarding claims 1, 5, 8 and 9, Cheung et al. teach a method for deposition of a film over a substrate comprising the steps of: forming a silicon-oxide-based film (240) by using SiH<sub>4</sub> and N<sub>2</sub>O on a substrate (200) by a PECVD process (see Fig. 3A, col. 5, lines 12-36, and Section IV: "Deposition of a Capping Layer or Hardmask" in cols. 19-20,); forming a chemically-amplified photoresist (22) (see Fig. 3A and col. 5, lines 12-36);

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transferring a mask pattern onto the chemically-amplified photoresist layer (see Fig. 3A and col. 5, lines 12-36); and etching the underlying layer (see Fig. 3A and col. 5, lines 12-36).

With regards to the claimed range of nitrogen, Cheung et al. discloses the limitation of "little or none of the nitrogen...is incorporated into the resulting film" (col. 5, lines 13-17, col. 15, lines 36-37; col. 16, lines 14-16; col. 19, lines 48-50; and col. 20, lines 17-23), which encompasses the claimed limitation of wherein "a nitrogen content...is made to about a value of 0.01 atm% to 0.08 atm%."

With regards to the claimed temperature range, it would have been obvious to one of ordinary skill in the art to include a temperature of over 400 °C, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Huang*, 40 USPQ2d 1685,1688(Fed. Cir. 1996) citing *In re Aller*, 105 USPQ 233., 235 (CCPA 1955).

Regarding claim 3, Cheung et al. teach a further step of exposing the silicon oxide based film to a plasma atmosphere of O<sub>2</sub> or N<sub>2</sub>O (see col. 5, lines 2-5; col. 19, lines 25-58 and col. 20, lines 1-59).

Regarding claim 6, Cheung et al. teach forming the silicon-oxide-based by means of a PECVD (see col. 19, lines 40-42 and col. 20, lines 28-31).

### ***Respons to Argum nts***

4. Applicant's arguments filed April 12, 2004 have been fully considered but they are not persuasive. The examiner acknowledges that Cheung et al. teaches a range of temperature in column 20, lines 28-30, which is lower than the now claimed range. However, it is noted that both Cheung et al. and Applicant achieve the same result of producing a fine pattern by lowering the nitrogen content of the silicon-oxide-based film. For instance, see figure 10B and column 7, lines 20-25 of Cheung et al., and pages 7, lines 23-30 and page 20, lines 2-9 of Applicant's specification. It has been held that optimization of a working range is *prima facie* obvious in the absence of new or unexpected results. *In re Huang*, 40 USPQ2d 1685,1688(Fed. Cir. 1996).

### ***Correspondence***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R. Díaz whose telephone number is (571) 272-1727. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRD  
6/26/04

  
TOM THOMAS  
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